The analyses of felspars from the North of Ireland, quoted by Dr. Apjohn, could not, Sir Robert Kane remarked, have any reference to a question as to the nature of the felspars in the south-east, nor could the crystallographic or analytical details into which Dr. Apjohn had entered. The real question was, the average constitution on the great scale of the granitic district lying to the south of Dublin, and on this Sir Robert Kane considered the conclusions suggested in his former notice to be perfectly unimpeached, although in special localities deposits of true potash felspars (orthoses) may occur, a fact of which Sir Robert Kane was, of course, perfectly aware, and never could have contemplated to deny.

The Rev. Dr. Lloyd read a paper on the magnetic influence of the moon.

" The influence of the moon upon the position and movements of the magnetic needle seems to have been first recognised by Professor Kreil. From the discussion of the magnetical observations made at the Prague Observatory, in 1839 and 1840, he has inferred that there existed a small periodical variation in the position of the freely suspended horizontal magnet, dependent upon the position of the moon with respect to the meridian. The question has been again examined, in this and in other bearings, by Mr. Broun, the able Director of Sir Thomas Brisbane's Observatory at Makerstoun, in Scotland, and the action of the moon has been apparently traced in a variety of periodical laws, dependent not only upon her hour-angle, but also upon her declination and distance from the earth.

" Notwithstanding the very remarkable nature of the phenomenon thus announced, the question has since remained unexamined, and the conclusions unconfirmed, by other observers. Whether the small changes deduced by Professor Kreil and Mr. Broun were thought to be within the limits of the errors of observation, or the apparent improbability of

the effect announced was supposed to outweigh the positive
evidence adduced in proof of it, it has so happened that none
of the numerous staff of magnetical observers, now scattered
over the globe, have since resumed the question.

"I confess myself to have been one of those who doubted
the conclusion announced on both the grounds alluded to. I
did not think that variations so small as those inferred could
be fairly construed into a physical law, unless they were
found systematically consistent with themselves for a greater
number of periods than those hitherto examined; and the an-
tecedent improbability of the action combined with the na-
ture of the evidence to deter me from the labour of the inquiry.
The periodical laws in terrestrial magnetism, hitherto disco-
vered, point to the sun as their physical cause; and many cir-
cumstances appear to indicate that the sun in this case acts
mainly, if not entirely, through the medium of changes of
temperature. Thus I have shown that a very remarkable re-
lation exists between the diurnal ranges of the declination and
horizontal intensity, and the diurnal ranges of temperature;
and the annual variations of the same elements present a simi-
lar correspondence.* Now, the thermal effect of the moon is
so small as to be incapable of being detected by the most de-
licate instrumental means; and I inferred that its thermo-
magnetic properties must be likewise insensible. But, having
now satisfied myself of the *fact* of the lunar action, it is plain
that there was an error somewhere in this reasoning; and I
believe the erroneous premiss to be, the assumption that the
lunar action, if it existed, must be analogous to the solar.

"The most hopeful mode of inquiry into the fact of the lu-
nar magnetic action appears to be an analysis of the diurnal
range of the magnetic declination in reference to the moon's

* Results of Observations made at the Magnetical Observatory of Dub-
lin, Transactions Royal Irish Academy, vol. xxii. pp. 85 and 91; and Pro-
ceedings, vol. iv. p. 379.

age. The diurnal range is the phenomenon in which the solar magnetic action is most conspicuously displayed; and in it, if anywhere, we should expect to find evidences of the periodical action of another luminary. In fact, if the moon co-operates with the sun, in the course of the day, in its effect upon the position of the free magnet, we should expect the range to be greater in certain portions of the moon's age than in others, the separate actions of the two luminaries, as in the analogous case of the tides, at one time conspiring, and at another being opposed. We have, therefore, only to analyze the diurnal range, in reference to the moon's age, and such joint action, if it exists, will be manifested by a variation in the magnitude of the range, whose period is the synodic month.

"I have, accordingly, calculated the daily range of the declination for eleven years, viz., from 1840 to 1850 inclusive, and arranged the resulting numbers according to the moon's age. As there are two periods of greatest easterly deviation of the magnet in each day, the range is double, viz., from 7 A.M. to 1 P.M., and from 1 P.M. to 10 P.M.; the mean of these is here taken. When the twelve lunations of each year are combined, and the means of the ranges corresponding to the same day of the moon's age taken, the resulting numbers exhibit a periodical variation, the range being greatest in the first and third quarters, and least in the second and fourth. But as the law is not exhibited with distinctness for each year, even in these numbers which are the means of 24 separate results, I have again combined them in groups of 7 and 8 alternately, corresponding to the four quarterly periods. The following Table gives the results. The numbers are the differences between the mean ranges in each of the four quarters and in the entire month, for each of the eleven years :—

Year.	I.	II.	III.	IV.
1840	+ 0′·06	– 0′·30	+0′·43	– 0′·19
1841	+ 0·04	– 0·01	+ 0·33	– 0·35
1842	+ 0·71	– 0·27	+ 0·25	– 0·70
1843	+ 0·65	– 0·48	+ 0·29	– 0·45
1844	+ 0·47	– 0·12	+ 0·43	– 0·78
1845	+ 0·32	– 0·48	+ 0·68	– 0·54
1846	+ 0·38	– 0·14	+ 0·60	– 0·84
1847	+ 1·12	– 0·29	– 0·62	– 0·22
1848	+ 1·14	– 0·49	+ 0·24	– 0·88
1849	+ 0·59	– 0·44	+ 0·66	– 0·81
1850	+ 0·59	– 0·91	+ 0·29	+ 0·04
Means	+ 0′·55	– 0′·36	+ 0′·33	– 0′·52

" These results leave no doubt of the existence of a lunar period. In fact, there are but two instances, out of forty-four, in which the rule announced does not hold. The mean difference of the first and second quarters is 0′·91, and that of the third and fourth 0′·85.

" It has been stated, that the law of the variation is not exhibited distinctly, from day to day, in the separate years. But when we combine the results of the eleven years, we obtain a series of numbers, in which the law of the change from day to day is evident. The following are the results:

Day.	Range.	Day.	Range.	Day.	Range.	Day.	Range.
0	9′·78	7	9′·66	15	9′·59	22	8′·79
1	10·27	8	8·91	16	10·07	23	9·02
2	10·15	9	8·94	17	9·94	24	9·16
3	10·77	10	8·87	18	10·23	25	9·14
4	10·27	11	9·12	19	10·10	26	8·83
5	10·24	12	8·92	20	10·00	27	9·38
6	9·55	13	9·33	21	9·52	28	9·60
		14	10·14			29	8·71

We see here, as before, that the range is greatest in the first and third quarters, and least in the second and fourth. The

maxima occur about the 3rd and 18th days of the moon's age, and the minima about the 10th and 24th days.* The mean amount of the variation is 1'·5, which is consequently double of the effect due to the lunar action. The mean magnitude of the range itself, from which the lunar variation is eliminated, is 9'·6; so that the effect of the moon is to that of the sun as 1 to 13 nearly.

" It is obvious that the numbers above given are the resultants of two oscillations, whose periods are different, and which therefore combine in every variety of phase, namely, the diurnal changes produced by the two luminaries; and, on account of the doubling of the lunar change, they are well fitted to establish its existence. The next step in our inquiry will be to ascertain the law of the variation, whose total amount has been here deduced. This can be done only by an analysis of the hourly observations in reference to the moon's hour-angle, which will form the subject of another communication."

The author concluded by some remarks upon the supposed ten-year periodical variation of the mean yearly range, indicated by Professor Lamont, and upon the corresponding variation of the mean disturbance noticed by Colonel Sabine. Although quite prepared for a correspondence between these phenomena, upon grounds stated in a paper formerly read to the Academy,† he doubted the existence of a true period in either.

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* It would seem as if there were two minima, with a small intervening maximum, in the fourth quarter. These results differ altogether from those of Mr. Broun, by whom the effect of the moon's age upon the range of the magnetical declination has been also examined. According to him, the diurnal range of the magnetic declination has but one maximum and one minimum during the month, the maximum occurring two or three days after full moon, and the minimum about three days before new moon.

† Transactions of the Royal Irish Academy, vol. xxii. p. 94.